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CENTRAL INTELLIGENCE AGENCY
WASHINGTON, D.C. 20505

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[redacted]

27 November 1973

[redacted]

MEMORANDUM FOR: William E. Hale
LNG Competitive Price Task Group
Council on International Economic Policy
Old Executive Office Building

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SUBJECT : LNG Project Costs and Prices

[redacted]

The attached table of LNG costs and prices is being forwarded as requested during our telephone conversation on 21 November 1973. Generally the data reveal a wide variation in estimates due to the subjective views of different estimators as to costs, volumes, inflation, interest rates, economies of scale, and transport distances. If you have further questions we will try to answer them. You will note that the order of projects differs somewhat with those on the list forwarded earlier, but this change was necessary since the status of several projects has advanced while others are only tentative.

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Resources Branch
Office of Economic Research

Attachment:
As stated

Distribution: (S-5669)
Orig & 1 - Addressee
1 - D/OER
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1 - St/CS
1 - SA/ER
1 - U/RE
OER/U/RE: [redacted] (26 Nov 73)

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A Comparison of Existing, Planned and Proposed LNG Projects [illegible]

LNG Project		Gas Volume (Million CFD)	CIF Price ($/1000 CF)	FOB Price ($/1000 CF)	LNG Plant + Port (Million $)	Gathering and Pipeline (Million $)	Tankers (Million $) Size	Shipping Distance (Nautical Miles)	Project Start-UP (Year)	Comments
Operational										
Algeria Arzew	UK, Canvey	100	$.76	?	$87 with Port	$70 (24 inch 300 mile)	(2) $25 (27,500$m^3$)	1,900	1964	
	France, LeHavre	50	.62	?			(1) 15	1,900	1965	
Alaska Kenai	Japan, Tokyo	140	.52	?	100	?	(2) 52 (71,500m^3)	3,400	1969	
Libya Marsa El Brega	Italy, LaSpezia	240	.39	?	200 with Port	?	(3) 125 (39,750m^3)	800	1971	Many delays due to technical & political problems which caused cost overruns to exceed plans.
	Spain, Barcelona	110	.44	.34			(1) ? (39,750m^3)	950	1971	
Algeria Skikda	France, Fos	350	.39	.33	190	?	(2) 60 (39,750m^3)	400	1972	2 years behind schedule
	US Distrigas, Boston	50	.68 - .84	?	?	?	(2) 105 est. ?	3,600	1972	
Brunei	Japan #1	550	.49	?	220 + 55 Port	?	(4) 190 (73,140m^3)	2,500	1972	
	Japan #2	225	.80 - .90 est	?	170	?	(2) 135 (73,140m^3)	2,500	1974	
Firm Plans or Under Construction Using 1975/1976 Costs and Prices										
Algeria Arzew	- US-El Paso #1 Cove Point & Savannah	1,000	.77 - .83	.31	318 + 87 Port	181 (40 inch 300 mile)	(9) 742 (125,000m^3)	3,470	1976	
	- US-EL Paso #2	1,000	1.03 - 1.09 est	.42	?	?	(9) 1,000 est	3,470	1980 est.	
	- US-EAPCO	600	1.03 - 1.09 est	.46	265	?	(4) 270+ (125,000m^3)	3,400	1976	
-7 Country W. European Consortium		1,500	?	.41	?	?	?	1,000-2,000	1978	
	- W. Germany	1,200	?	?	?	?	?	2,000	1979	
	- Spain	150	.39	?	120	?	(1) 20	300	1974	
		450	?	?	340 est	?	(2) ?	300	1976 est.	
Sarawak	- Japan	700 - 1,000	.95	?	300 + 20 Port	?	(4) 240+ (125,000m^3)	3,700	1977	
N. Sumatra	- US West Coast	550	.95 - 1.30 est	.63	400	?	(5) ?	7,000	1978	
	- Japan	550	.90 est	?	?	?	? ?	4,000	1978	
Trinidad	- US Midwest	500	?	?	260 with Port	?	(3) 140 (73,750m^3)	1,900	1976	
Proposed or Tentative Using 1979/1980 Costs and Prices										
USSR	- US-"North Star"	2,000	1.25	.60	1,508 with Port	2,246 [1] (48 inch 1500 mile)	(20) 2,631 (125,000m^3)	4,033	1978-1979	[1] Includes $55 million worth of pipelaying equipment
USSR	- US & Japan-"Yakutsk"	1,000 (Los Angeles) 1,000 (Tokyo)	1.00 - 1.10 .90	.50 - .60 ?	512 + 48 Port	2,000 [2] (56 inch 2000 mile)	(16) 1,600 (125,000m^3)	4,500 500	1979-1981	[2] Includes $265 million worth of pipelaying equipment
Kalimantan	- US or Japan	300	?	?	?	?	?	7,500 to US	1978	
Ecuador	- US	400	?	?	?	?	?	3,200	?	
Alaska	- US	200 - 400	?	?	280	?	(1) 135 (125,000m^3)	2,200	1977	
NW Australia	- US or Japan	600	?	?	?	?	?	8,000-2,500	1977	
Nigeria	- US	1,200	[illegible]	[illegible]	[illegible]	?	?	3,100	?	
Venezuela	- US	400	?	?	?	?	?	1,900	?	

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CIA/OER/S-05671-73

15 November 1973

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MEMORANDUM FOR: Mr. Lambert Heyniger
INR/RAA/CS
Department of State

SUBJECT : Effects of the Arab Oil Cutback on Sub-Saharan Africa

1. In response to your request, we are attaching our comments on the effects of the Arab oil cutback on Sub-Saharan Africa. If you have additional questions, please feel free to call [redacted] 25X1

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2. Because of the possible interest of other components of the Washington economic community in this subject, this office may send the attached material to other interested officials.

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Chief, Near East/Africa Branch
Developing Nations Division
Office of Economic Research

Attachment:
As stated above

Distribution: (S-project 5671)
Orig. & 1 - Addressee
1 - D/OER
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OER/D/NE: [redacted] (15 November 1973)

[redacted]

Sub-Saharan Africa: Effects of the Arab Oil Cutback

General

The 40 plus countries of Sub-Saharan Africa that depend heavily on Middle East oil purchased through Western oil companies can be expected to weather the Arab oil embargo with minimum difficulties, after the initial dislocations. The Black African countries have given nearly unanimous support to the Arabs, assuring preferential treatment, but the extent of cooperation by the Western oil companies that control distribution is unclear. In any event, the Black Africans' total import needs for crude oil and products are small, averaging only about 290,000 bpd in 1971, and their agricultural economies are not yet heavily dependent on oil (see Table 1). Nigeria could and probably would divert a portion of its exports to make up critical deficits, except to the white-dominated southern African countries. South Africa, already embargoed by Saudi Arabia, has abundant reserve stocks on hand and can reduce consumption without drastic consequences to the economy.

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Table 1

Sub-Saharan Africa: Dependence on Petroleum Imports, 1971

Thousand barrels per day

	Crude			Refined Products			
	Production	Imports	Exports & Re-exports	Refinery Throughput	Imports	Exports & Re-exports	Domes Demand
Total Sub-Saharan Africa	1,760	460	1,680	500	200	150	540
Total Black Africa	1,650	190	1,590	250	100	70	270
Nigeria	1,530	none	1,490	40	10	10	40
Other West Africa	120	80	100	100	30	10	110
East Africa	none	110	none	110	60	50	120
Total Southern Africa	110	270	90	250	100	80	270
South Africa	none	250	none	220	80	70	230
Other Southern Africa	110	20	90	30	20	10	40

a. Totals may not add due to rounding.
b. Includes bunkering.

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Black African Countries

The agricultural economies of Black African countries depend on petroleum products mostly for transport, and to a lesser extent for industry and electric power. These countries still rely heavily on coal and hydroelectric power and use charcoal and wood for home fuels. Black African countries produced slightly more than 2 million bpd of crude oil in 1972, most of it in Nigeria. Gabon and the Congo were small producers. Black African refining capacity, which depends largely on imported crude, amounted to 290,000 bpd in 1972, and exceeded total consumption (see Table 2). Sources of petroleum for particular Black African countries are difficult to sort out among the major Western oil companies, making it impossible to quantify the direct impact of the embargo. If the Black Africans are affected by the Arab cutback, the key to continued availability of necessary supplies of oil probably will be Nigeria.

Nigeria has been striving to strengthen its position of leadership in Africa and could seize upon the current oil situation as one of the means to this end. Nigeria with annual production exceeding 2 million bpd is the sixth largest oil exporter and the second largest supplier

Table 2

Sub-Saharan Africa: Refining Capacity, 1972

	Thousand barrels per day
Total Sub-Saharan Africa	590
Total Black Africa	291
Ethiopia	15
Gabon	17
Ghana	29
Ivory Coast	23
Kenya	50
Liberia	10
Malagasy Republic	14
Nigeria	60
Senegal	12
Sierra Leone	10
Sudan	21
Tanzania	17
Zaire	13
Total Southern Africa	299
Angola	14
Mozambique	18
Rhodesia	21 a/
South Africa	246

a. Currently inoperative due to sanctions against Rhodesian crude imports.

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of crude to the US. More than one-fourth of Nigeria's oil is exported to the US. Nigeria therefore could supply all of Black Africa with crude oil by diverting a part of its exports that now go to the US. Nigeria also will have available a growing quantity of government-owned oil not controlled by the international oil companies. Nigeria is a member of OPEC and as such has been enjoying the fruits of OPEC negotiations for participation and increased prices for crude. In recent negotiations with the oil companies Nigeria almost doubled the posted price of crude from $4.287 to $8.310 per barrel. Nigeria broke diplomatic relations with Israel on 25 October, but has as yet made no move to join the Arab embargo. Exports are continuing to go to the US and other Western markets.

<u>Southern Africa</u>

The Republic of South Africa has no domestic sources of petroleum and must import products as well as the crude to feed its refining capacity of nearly 250,000 bpd. Imports in 1971 were at the rate of about 330,000 bpd, and this was increasing. Domestic demand for refined products in 1971 was 230,000 bpd. Abundant coal resources fueled about 75% of the country's energy needs including

90% of the railway locomotives and 99% of the electric power capacity. South Africa has a coal hydrogenation plant which produces about 12,000 barrels per day of oil. In addition to fulfilling South Africa's domestic requirements, imported petroleum also serves to meet commitments for exports to Rhodesia, Zambia, and other southern African countries, and provides bunkering for ships transiting the Cape of Good Hope.

South Africa gets most of its oil from the Middle East (see Table 3). We estimate that about 20% of oil imports came from Saudi Arabia, the remainder coming largely from Iran and Iraq. South Africa has several alternatives that will help to cushion the impact of reduced oil supplies. Stockpiles of crude oil that were accumulated in reaction to Apartheid-related threats of trade sanctions exceed six-months' requirements at current consumption levels. In the short run, Pretoria can forego the additions of 30,000 - 40,000 bpd to stockpiles, reduce bunkering activities, reduce exports, and tighten the limited rationing program already imposed on domestic consumption. In the long run the economy might be forced to slow or reverse its increasing conversion to the use of oil. In addition, some gains can be

Table 3

South Africa: Estimated Sources of Petroleum Imports, 1971

	Thousand barrels per day
Middle East a/	320
Iran	210
Iraq b/	50
Saudi Arabia	60
Other c/	10
Total	330
Of which:	
Crude	250
Refined	80

a. Because of vulnerability to sanctions, Pretoria withholds statistics on the amounts of petroleum purchased from major Middle Eastern suppliers. Our rough estimates are based on Saudi and Iraqi export statistics; no petroleum exports to South Africa are listed in the statistics of other Arab oil exporters.
b. All South African petroleum imports from Iraq are of crude oil.
c. Includes Western Europe, US, Venezuela, Australia, and Mozambique; these imports consist exclusively of refined products.

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achieved by accelerating work on expanding the coal hydrogenation plant.

The Portuguese states of Angola and Mozambique control the remainder of Southern Africa's petroleum production and refining capacity; Angola's production of crude currently is about 150,000 bpd. The Arab embargo already imposed on Portugal probably will include a cut in Mozambique's crude imports, which originated entirely in Iraq in 1972. Lisbon could divert some Angolan crude production to offset a Mozambique shortfall but domestic Portuguese requirements probably will take precedence. Rhodesia's requirements -- an estimated 8,000 to 12,000 bpd -- are imported via Mozambique and South Africa. Reduced supplies would put a serious crimp in Rhodesia's consumption of automobile and tractor fuel but other energy needs are fueled mainly from the country's abundant coal reserves.

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